



# Leadership Actions to Improve Nuclear Safety Culture

## Len Clewett – EVP & CNO



# Introduction

- The challenge:
  - How to effectively implement and then utilize the result of Safety Culture Assessments
- Bruce Power recently changed the Safety Culture Assessment process
- The results have been proven effective with step change performance observed



# About Bruce Power

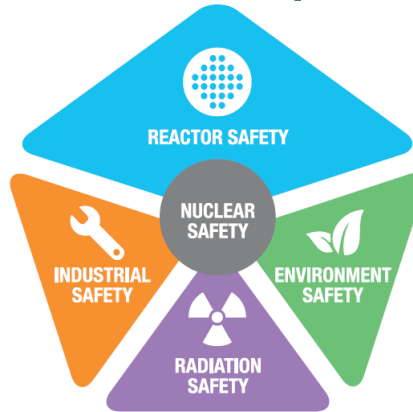
- Nuclear Safety is our core value
- Home to eight CANDU reactors
- Entered into an amended long-term agreement in late 2015



# About Bruce Power

- Nuclear Safety is based on four pillars:

- Reactor Safety
- Industrial Safety
- Radiological Safety
- Environmental Safety



- Processes and practices are in place to achieve a healthy Nuclear Safety Culture, which correlates with excellence in Nuclear Safety Performance

# Management Effectiveness Review

- Effective leadership oversight:
  - Sets standards and behaviour expectations
  - Day to day controls to monitor the operations of facilities
  - Reinforce the behaviours associated with the expectation of a healthy Nuclear Safety Culture



# Management Effectiveness Review

- Bruce A and Bruce B previously conducted Safety Culture Assessments independently
- In 2012, the assessment approach was reviewed
- The review benchmarked industry practices internationally in the field of safety culture





# Management Effectiveness Review

- Significant revisions include:
  - Regular Nuclear Safety Culture Monitoring Panels
  - Engaging workers in the launch of the Traits of a Healthy Nuclear Safety Culture
  - Refreshing leadership training around safety culture
  - Conducting one company safety culture assessments – “stations” plus “corporate”.



# Safety Culture Assessment Methodology

- Purpose of the Self-Assessment:
  - Gather input on how employees perceive safety at Bruce Power
- This method cannot rate safety performance in absolute terms
  - It is designed to surface people's concerns, behaviour patterns and other insights to help management improve safety culture





# Safety Culture Assessment Methodology

- Self Assessment approach:
  - A survey
  - Interviews
  - Focus groups
  - Insights from the Nuclear Safety Culture Monitoring process of the previous year



# Logistic

- Assessment project leader was assigned
- Industry expert in Safety Culture engaged
- Three teams, a total of 34 individuals were used to conduct interviews

# Safety Culture Survey

- The electronic survey was delivered in May 2013
- Consisted of 65 questions, plus a set of 10 cultural pattern questions
- 2,932 surveys were returned and 13,092 written comments provided
- Response rate of 54%
- Organization information and primary work location were inquired for high level demographic information



# Interviews and Focus Groups

- Interviews and focus groups were held with a total of 290 people
- Interview questions were identical to the survey questions
- Administered by pairs of interviewers to cross section of staff from each location



# Determination of Ratings

- Interview results reviewed against survey results to determine final rating for each question
- Result classifications include:
  - Weak
  - Concern
  - Reasonable
  - Healthy



# Safety Culture Assessment Results

- Oversight provided with an executive committee chaired by the Chief Nuclear Officer
- A cross department team of individual contributors, supervisors, and managers reviewed results.
- Nuclear safety culture similar across company.



# Safety Culture Assessment Results

- Higher level of management have a more positive view of nuclear safety culture than other layers of the organization
- No major difference in the perspective of nuclear safety culture between:
  - Regular and non-regular staff
  - Hands on workers and office workers
  - People with different years of experience
  - Males and females



# Frequently Raised Issues

- Nuclear Safety Focus
- Equipment Condition
- Corrective Action Program
- Management Presence

# Nuclear Safety Focus

- The focus placed on nuclear safety is high
- However, the effect of decision-making on the long term health of the plant was a central theme raised at the working level



# Equipment Condition

- Predominant view is that the operating plant equipment condition can be improved
  - Backlogs need to be reduced.
- Strong faith that the plants are operated within the design limits
  - Concerned with accumulated effect of deficiencies

# Corrective Action Program

- Level of support for the Corrective Action Program (CAP) was inconsistent
- Actions were not always effective
- Communication gaps exist regarding the purpose, value and performance of the process

# Management Presence

- Field presence of managers above first line manager level was low
- Managers focused too much on data and not enough on talking with people and understanding what is not working and why

# Safety Culture Assessment Actions

- Three main focus areas identified
  - Improve Equipment Health
  - Improve the Corrective Action Program/ Learning Organization
  - Improve first line manager communication/ Visual Management Boards
- These focus areas were integral to the enhanced performance in operational excellence and the four pillars of nuclear safety

# Equipment Health Initiative



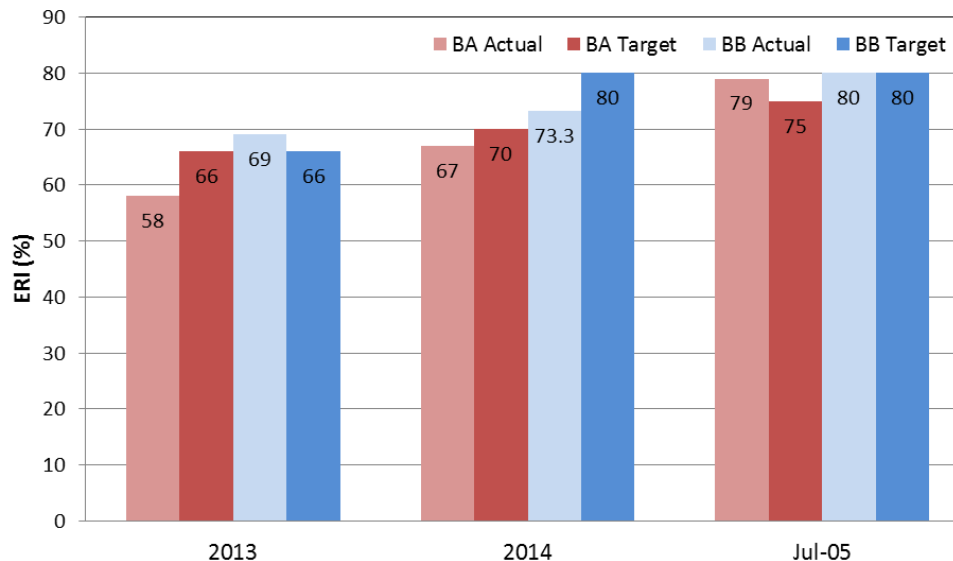
- Improve the Equipment Health
- Vision in Equipment Health:
  - “We are aligned and relentless in our pursuit of excellence in equipment health”
- Cross functional team selected
- Strong Senior Vice President sponsorship and endorsement



# Results

- Improved Equipment Reliability Index
- Decreased Corrective Critical and Deficient Critical backlogs
- Record eight unit Forced Loss Rate

**2013-2015 Equipment Reliability Index Trend**



# Visual Management Boards Initiative

- Address the weakness in Leadership Safety Values and Actions INPO Trait, Field Presence (LA.2.)
- Visual Management Boards (VMBs) are a tool borrowed from Lean Manufacturing methods



# Visual Management Boards Initiative

- 330 VMBs actively used daily across site
- VMB contents include:
  - Safety
  - Plant Status
  - Daily Focus Areas
  - Station Priorities
  - Operating Experience (OPEX)
  - Outage Performance
  - Business Performance
  - Other Communications

# Visual Management Boards Initiative

- Other elements to support Nuclear Safety and improve situation awareness include
  - The 2x2 Risk Matrix
  - Work Crew and Departmental Performance metrics

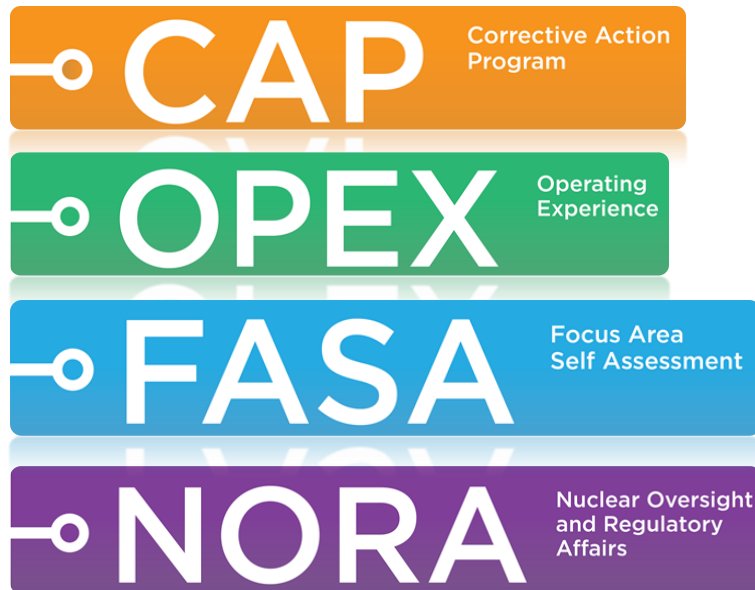
# Results

- Increased leader field presence, improved communication, and an increased awareness by all staff
- Average VMB Observation and Coaching checklists completed increased from 367 to 475 between 2014 and 2015 respectively

# Learning Organization/ Improve CAP Initiative



- Address weakness in Continuous Learning INPO Trait and the problem Identification and Resolution INPO Trait
- Four elements:



# Results

- SMART action computer based training
- Effective use of operating experience and Focus Area Self Assessment
- Strengthened Independent Oversight organization



# Lessons Learned and Next Steps

- Key Success Factors:
  - Site wide initiative
  - Establishment of sponsorships
  - Focus on top three issues
  - Oversight at Corporate Corrective Action Board



# Lessons Learned and Next Steps

- 2016 Assessment
  - Q3 of 2016
  - Include a focus on security culture
  - Additional focus groups on specialized topics such as :
    - Contractor oversight
    - Technical conscience
    - Security culture



# Conclusion

- This integrated frame work provides a valid characterization of the Nuclear Safety Culture and drives continual improvement
- Values of these new methods have been validated through good safety and commercial performance

# Conclusion

- Significant improvements accomplished in the areas of:
  - Nuclear Safety
  - Safety Culture
  - Human Performance
  - Equipment Reliability
  - Generation
  - Outage performance
- While achieving significant three year operating budget savings



# Conclusion

- Bruce Power continues to look for innovative methods for improving safety culture
- Recognize providing consistent and aligned leadership message is vital to our success
- Vigilance and preparedness must be exercised in fostering an environment where safety continues to be the overriding consideration



# Questions?

